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(54) **A PROCESS FOR PROVIDING CUT FILLER FOR CIGARETTES**

VERFAHREN ZUR HERSTELLUNG VON SCHNITTTABAK FÜR ZIGARETTEN

PROCEDE PERMETTANT D'OBTENIR DU TABAC HACHE POUR CIGARETTES

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(73) Proprietor: **Philip Morris Products Inc.**
Richmond Virginia 23234 (US)

(72) Inventors:
• **SALMON, Brian**
CH-1806 St. Legier-la-Chiesaz (CH)

• **FRATTOLILLO, Antonio**
I-73039 Tricase (IT)

(74) Representative: **Marlow, Nicholas Simon**
Reddie & Grose
16, Theobalds Road
London WC1X 8PL (GB)

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Description

[0001] In the initial stages of the production of cut filler for smoking articles such as cigarettes, cured tobacco leaf is classified into top, middle and bottom leaf, the top leaves being those nearest the plant top, or mixtures thereof. These classes are further graded by quality and the resulting numerous grades of leaf are threshed to remove the leaf lamina from the stem or mid rib, and are redried and packed for shipment. Between curing and redrying, the leaf and stem are usually referred to as "green".

[0002] In conventional processes, the stem grades are classified by diameter and length, dried to an o.v. (oven volatiles content) of around 10 or 11% and classified into long stem pieces suitable for direct use, subject to primary processing in filler, and shorter stem pieces suitable for use in the manufacture of tobacco sheet. The stem is packaged for transport from the stemmery to the cigarette factory, which may well be in another country or continent. In the cigarette factory, the long stems for direct use as filler are preblended with other stems from the same and/or different sources, and subjected to primary processing including conditioning and soaking in water for a few hours followed by rolling flat, cutting and drying using known techniques. The cut dried stem is blended with cut tobacco lamina which has been subjected to a primary processing to provide a cut filler for cigarettes or other smoking articles.

[0003] In conventional processes, the stems are subjected to mechanical damage during rolling, because their structure has been weakened by the drying process and subsequent insufficient conditioning because of insufficient moisture penetration. The rolled stems are of different thicknesses because the stems prior to rolling are of different diameters, lengths and physical properties. This means that the final cut stem filler for blending with cut lamina filler are not of optimal quality.

[0004] EP-A-0 539 064 discloses a method and apparatus for preparing tobacco leaf stem wherein whole stem is separated into a large-stem fraction and a small stem-fraction. The large-stem fraction is then cut in a stem cutter and the small-stem fraction is shredded in a mill.

[0005] According to the invention there is provided a process for preparing tobacco stem for use as filler for a smoking article comprising:

classifying the tobacco stem to provide a plurality of stem grades;
rolling each stem grade separately, each grade being rolled under rolling conditions optimised for that grade. It is preferred that the rolling conditions for each grade are such that the resulting rolled stems of all grades are of a substantially uniform thickness. It is also preferred that the classification is according to the position on the tobacco plant of the leaf from which the stem originated.

[0006] Alternatively, the classification is according to stem diameter. Most preferably, the classification is according to the position on the tobacco plant of the leaf from which the stem originated and then by further classifying each resulting grade of stem prior to rolling according to stem diameter to produce the plurality of grades for rolling. Also preferably, the classification according to the position on the tobacco plant of the leaf from which the stem originated is conducted on cured tobacco leaves prior to threshing.

[0007] It is also preferred that a further classification is carried out on the green flat rolled stems, preferably before drying; this classification (cleaning) may be by air separation, and can produce a grade of rolled stem suitable for direct use for primary processing into filler without drying, and a by-product suitable for the manufacture of tobacco sheet. After drying, a further stem classification, similar to the previously described classification, can be conducted on the dried rolled stem.

[0008] All the processing steps mentioned above (other than primary processing and manufacture of tobacco sheet) can be carried out in the stemmery prior to packaging of the rolled stem and shipping to the cigarette factory. The rolled stem may be dried prior to packaging for transport, before or after any post rolling classification.

[0009] The invention also provides, in a second aspect, a process for preparing tobacco stem for use as filler for a smoking article comprising grading rolled tobacco stem into at least two grades.

[0010] The invention also provides a process for the manufacture of smoking articles such as cigarettes comprising forming cut filler made by a process according to the first or second aspects of the invention into a smoking article.

[0011] The invention also provides a smoking article comprising filler made by a process according to the first or second aspects of the invention.

[0012] The invention will be further described, by way of example, with reference to the accompanying figure which is a flow chart showing a preferred embodiment of a process according to the invention for making cigarettes.

[0013] Cured tobacco leaves are classified (1) according to their stalk position on the plant and further by leaf quality to give as many as forty grades of leaf. The classified leaf is threshed (2) to separate the lamina from the stem. This produces stem (5), by-product tobacco (P) for use in the manufacture of tobacco sheet as well as lamina (L). The lamina is treated conventionally, by drying and packaging for shipping to the cigarette factory for conventional primary processing.

[0014] The grades of green stem (A) obtained by the pre-threshing classification are subjected to a first stem classification (3) by stem diameter, length and optionally by other characteristics such as moisture content. The thus obtained grades of classified stem are rolled separately (4) to produce graded flat rolled stem. The rolling technique is well known; the stems are passed through the nip between contra-rotating rollers. However, the nip size can be adjusted to that optimal for each grade of stem, to achieve a uniform rolled stem thickness, for example of 1.1 mm. This is made easier when the stem has been classified (3) by diameter. The stem is rolled green, that is, before any post-curing drying process, although after threshing; the stem is therefore rolled at an o.v. of about 15 to 30%. If necessary, the o.v. of the stem can be adjusted before rolling, for example by conditioning with moisture. The flat rolled stem is subject to a second stem classification (5). This second stem classification is into heavy (A) and light (B) fractions, and can be done by air separation, a classification technique not previously applied to stems. Because the flat rolled stem is of substantially uniform thickness, the weight of the flat rolled stem pieces is substantially proportional to their surface area, so the second stem classification (5) serves to separate pieces (A) of larger area, suitable for direct use as cut filler, from pieces (B) of smaller area, suitable for use in the manufacture of tobacco sheet. Because the rolling conditions have been optimised for each grade of stem, the proportion of large pieces (A) to small pieces (B) is greater than after stem rolling in conventional stem treatments and the average size of the pieces is greater (see the table). This means that a greater proportion of the stem can be used directly for filler rather than as by-product for tobacco sheet, and that the average stem length of the stem directly usable as filler is greater than with conventional techniques. The stem is then dried (6).

[0015] The dried flat rolled stem may then be subjected to a third stem classification (7), which may also be by air separation. This third stem classification produces large (A') and small (B') dried flat rolled stem pieces which are both suitable for use, after primary processing, as cut rolled stem (CRS).

[0016] The larger pieces (A') of flat rolled stem are packaged (8) for shipping (9). Although the flat rolled stem is of higher o.v. than conventionally processed stem, which is dry (10 or 11% o.v., typically) at the packaging stage, the uniformity of flat rolled flat stem thickness and the mechanical strength afforded by the increased o.v. means that the stem can be packaged to a higher density, up to 25% greater than conventionally processed stem at the same o.v. This increased packaging density maintains the shape of the flat rolled stem flat during shipping (8) and protects the stem from mechanical damage.

[0017] It will be appreciated that not all the stem need be subjected to all the process steps described; for example, in addition to dried flat rolled stem, green flat rolled stem and green unrolled stem can be shipped from the stemmery directly to the cigarette factory for primary processing.

[0018] After shipping to the cigarette factory, the grades of flat rolled stem can be preblended (10) with each other and with graded flat rolled stem from other sources. The preblended stem is subjected to primary processing (11) which will include some or all of conditioning, heating, cutting and drying. Soak time for water penetration into the core of the stem is not required since the dry flat rolled stem absorbs liquid quickly compared to dry unrolled stem. The cut rolled flat stem is blended with cut lamina (12) to provide a cut filler blend which is used to manufacture cigarettes in a conventional manner (13).

[0019] It will be appreciated that the grades of stem produced by the first, green, classification (1), (3) can be mixed together if desired at any time after rolling (4); alternatively, the stem can be subjected to some or all of the primary processing steps in the grades produced by the first classifications, done before rolling, further classified by the second classification. This enables fine control of the characteristics of the final blend of cut filler to be exercised.

[0020] The following table indicates the improvement in stem length [immediately prior to primary processing] achieved by the process of the invention compared to conventional process:

LEAF POSITION AND TOTAL% OF STEM	STEM LENGTH	PROCESS OF THE INVENTION		CONVENTIONAL PROCESS	
		MIN.%	MAX.%	MIN %	MAX.%
TOP 24 - 27	LONG	18	24	15	20
	SHORT	6	3	9	7
MIDDLE 29 - 33	LONG	22	29	18	25
	SHORT	7	4	11	8
BOTTOM 25 - 30	LONG	19	27	16	22
	SHORT	6	3	9	8

In the table "long" indicates stems having a length of at least 30 mm, preferably no longer than 50 mm, more suitable

for direct use for filler production, and "short" indicates stems having a length less than 30 mm, more suitable for use in the manufacture of tobacco sheet.

[0021] In the second aspect of the invention, stem is classified after rolling. This may be done in an otherwise conventional stem treatment process in which stem is rolled as part of the primary processing, after drying and conditioning.

[0022] The invention, particularly in its first aspect, provides a process by which the yield of flat rolled stem which may be used directly as filler is increased, and by which the average stem length and thus the average length of cut filler from stem is increased. Thus, tobacco is used more efficiently. The stem may be subjected to primary processing and cutting while classified according to leaf stalk position on the plant, affording fine control of the characteristics of the blended cut filler. The invention also significantly improves the logistics of tobacco transport and handling. It allows stem to be packaged more densely for shipment, reducing shipping costs, wastage during shipping and storage costs. It has also been found that during green rolling of stem, the tobacco dust which may be produced is retained on the stem; the amount of dust produced during green rolling is anyway significantly less than during rolling after drying and reordering.

Claims

1. A process for preparing tobacco stem for use as filler for a smoking article comprising:
 - classifying the tobacco stem (1),(3) to provide a plurality of stem grades;
 - rolling each stem grade separately (4), each grade being rolled under rolling conditions optimised for that grade.
2. A process according to claim 1 in which the rolling (4) is carried out on green stem as herein defined.
3. A process according to claim 1 or 2 in which the rolling conditions for each grade are such that the resulting rolled stems of all grades are of a substantially uniform thickness.
4. A process according to any preceding claim in which the classification is according to the position on the tobacco plant of the stalk of the leaf from which the stem originated (1).
5. A process according to claim 1, 2 or 3 in which the classification is according to stem diameter (3).
6. A process according to any preceding claim in which the classification is firstly according to the position on the tobacco plant of the stalk of the leaf from which the stem originated (1) and then by a first stem classification of each resulting grade prior to rolling according to stem diameter (3) to produce the plurality of grades for rolling.
7. A process according to claim 4 or 6 in which the classification according to the position on the tobacco plant of the stalk of the leaf from which the stem originated (1) is conducted on cured tobacco leaves prior to threshing (2).
8. A process according to claim 7 in which the green tobacco stem has an o.v. of between 15 and 30%.
9. A process according to any preceding claim in which a stem classification is conducted on the green rolled stem (5).
10. A process according claim 9 in which the said stem classification of the green rolled stem (5) is by air separation.
11. A process according to claim 9 or 10 in which the said stem classification of the green rolled stem (5) provides at least two grades of green rolled stem (A) (B).
12. A process according to claim 9, 10 or 11 in which one of the grades (A) produced by the said stem classification of the green rolled stem (5) is suitable for direct conversion to cut filler (10,11,12).
13. A process according to claim 9, 10, 11 or 12 in which one of the grades (B) produced by the said stem classification of the green rolled stem (5) is suitable for use in the production of tobacco sheet.
14. A process according to any preceding claim in which the rolled stem is dried (6).
15. A process according to claim 14 in which the rolled stem is dried (6) to an o.v. of between 10 and 20%.

16. A process according to claim 14 or 15 in which a stem classification is conducted on the dried rolled stem (7).
17. A process according claim 16 in which the said stem classification of the dried rolled stem (7) is by air separation.
- 5 18. A process according to claim 16 or 17 in which the said stem classification of the dried rolled stem (7) provides at least two grades (A') (B') of dried rolled stem.
19. A process according to any of claims 14 to 18 in which the dried rolled stem is packaged (8).
- 10 20. A process according to any preceding claim in which the rolling (4) is carried out in the stemmery.
21. A process according to claim 20 in which the stem classification of the green rolled stem (5) is carried out in the stemmery.
- 15 22. A process according to claim 21 in which the stem classification of the dried rolled stem (7) is carried out in the stemmery.
23. A process according to any preceding claim in which the rolled stem is subject to further processing (10,11,12) to form cut filler for incorporation into smoking articles.
- 20 24. A process according to claim 23 in which the further processing (11) includes at least one of conditioning, heating, cutting and drying.
- 25 25. A process for making a smoking article comprising making cut filler according to claim 23 or 24 in which the said cut filler is incorporated into a smoking article such as a cigarette (13).
26. A process for preparing tobacco stem for use as filler for a smoking article comprising grading rolled tobacco stem into at least two grades.

Patentansprüche

1. Verfahren zur Vorbereitung von Tabakstängeln zur Verwendung als Füllmaterial für einen Rauchartikel, umfassend die folgenden Schritte:
35 Klassifizieren der Tabakstängel (1), (3), um eine Mehrzahl von Stängelqualitäten zu erzeugen; separates Walzen der jeweiligen Stängelqualitäten (4), wobei jede Qualität unter Walzbedingungen gewalzt wird, die für diese Qualität optimiert sind.
- 40 2. Verfahren nach Anspruch 1, bei dem das Walzen (4) an hierin definierten grünen Stängeln durchgeführt wird.
3. Verfahren nach Anspruch 1 oder 2, bei dem die Walzbedingungen für jede Qualität derart sind, dass die daraus hervorgehenden gewalzten Stängel aller Qualitäten eine im Wesentlichen einheitliche Dicke haben.
- 45 4. Verfahren nach einem der vorherigen Ansprüche, bei dem die Klassifizierung gemäß der Position des Stiels des Blattes, von dem der Stängel stammt, an der Tabakpflanze erfolgt (1).
5. Verfahren nach Anspruch 1, 2 oder 3, bei dem die Klassifizierung gemäß dem Stängeldurchmesser (3) erfolgt.
- 50 6. Verfahren nach einem der vorherigen Ansprüche, bei dem die Klassifizierung zunächst gemäß der Position des Stiels des Blattes, von dem der Stängel stammt, an der Tabakpflanze (1) und dann durch eine erste Stängelklassifizierung jeder resultierenden Qualität vor dem Walzen gemäß dem Stängeldurchmesser (3) erfolgt, um eine Mehrzahl von Walzqualitäten zu erzeugen.
- 55 7. Verfahren nach Anspruch 4 oder 6, bei dem die Klassifizierung gemäß der Position des Stiels des Blattes, von dem der Stängel stammt, an der Tabakpflanze (1) an getrockneten Tabakblättern vor dem Dreschen (2) erfolgt.
8. Verfahren nach Anspruch 7, bei dem der grüne Tabakstängel einen Ofen-Flüchtigengehalt (OV) zwischen 15 und

30 % hat.

- 5 9. Verfahren nach einem der vorherigen Ansprüche, bei dem eine Stängelklassifizierung am grünen gewalzten Stängel (5) durchgeführt wird.
- 10 10. Verfahren nach Anspruch 9, bei dem die genannte Stängelklassifizierung der grünen gewalzten Stängel (5) durch Luftseparation erfolgt.
- 10 11. Verfahren nach Anspruch 9 oder 10, bei dem die genannte Stängelklassifizierung der grünen gewalzten Stängel (5) wenigstens zwei Qualitäten von grünen gewalzten Stängeln (A) (B) hervorbringt.
- 15 12. Verfahren nach Anspruch 9, 10 oder 11, bei dem eine der Qualitäten (A), die durch die genannte Stängelklassifizierung der grünen gewalzten Stängel (5) produziert wird, für eine direkte Umwandlung in geschnittenes Füllmaterial (10, 11, 12) geeignet ist.
- 15 13. Verfahren nach Anspruch 9, 10, 11 oder 12, bei dem eine der Qualitäten (B), die durch die genannte Stängelklassifizierung der grünen gewalzten Stängel (5) produziert wird, zur Verwendung bei der Herstellung von Tabaklagen geeignet ist.
- 20 14. Verfahren nach einem der vorherigen Ansprüche, bei dem der gewalzte Stängel entfeuchtet wird (6).
15. Verfahren nach Anspruch 14, bei dem der gewalzte Stängel auf einen Ofen-Flüchtigengehalt (OV) zwischen 10 und 20 % entfeuchtet wird (6).
- 25 16. Verfahren nach Anspruch 14 oder 15, bei dem eine Stängelklassifizierung an entfeuchteten gewalzten Stängeln erfolgt (7).
17. Verfahren nach Anspruch 16, bei dem die genannte Stängelklassifizierung der entfeuchteten gewalzten Stängel (7) durch Luftseparation erfolgt.
- 30 18. Verfahren nach Anspruch 16 oder 17, bei dem die genannte Stängelklassifizierung der entfeuchteten gewalzten Stängel (7) wenigstens zwei Qualitäten (A') (B') von entfeuchteten gewalzten Stängeln hervorbringt.
- 35 19. Verfahren nach einem der Ansprüche 14 bis 18, bei dem die entfeuchteten gewalzten Stängel verpackt werden (8).
20. Verfahren nach einem der vorherigen Ansprüche, bei dem das Walzen (4) in der Stängelbearbeitungsanlage stattfindet.
- 40 21. Verfahren nach Anspruch 20, bei dem die Stängelklassifizierung des grünen gewalzten Stängels (5) in der Stängelbearbeitungsanlage stattfindet.
22. Verfahren nach Anspruch 21, bei dem die Stängelklassifizierung der entfeuchteten gewalzten Stängel (7) in der Stängelbearbeitungsanlage stattfindet.
- 45 23. Verfahren nach einem der vorherigen Ansprüche, bei dem der gewalzte Stängel einer weiteren Behandlung unterzogen wird (10, 11, 12), um geschnittenes Füllmaterial für den Einschluss in Rauchartikeln zu erzeugen.
24. Verfahren nach Anspruch 23, bei dem die weitere Behandlung (11) wenigstens eine Konditionierung und/oder Erwärmung und/oder einen Schnitt und/oder eine Entfeuchtung beinhaltet.
- 50 25. Verfahren zur Herstellung eines Rauchartikels, umfassend das Herstellen von geschnittenem Füllmaterial nach Anspruch 23 oder 24, wobei das genannte geschnittene Füllmaterial in einen Rauchartikel wie eine Zigarette (13) integriert wird.
- 55 26. Verfahren zur Vorbereitung von Tabakstängeln zur Verwendung als Füllmaterial für einen Rauchartikel, umfassend das Sortieren von gewalzten Tabakstängeln in wenigstens zwei Qualitäten.

Revendications

1. Procédé pour préparer des nervures de tabac à utiliser comme matière de remplissage pour un article à fumer, comprenant :

classer les nervures de tabac (1), (3) afin de fournir une pluralité de classes de nervures;
rouler séparément chaque classe de nervures (4), chaque classe étant roulée dans des conditions de roulage optimisées pour cette classe.

2. Procédé selon la revendication 1, dans lequel le roulage (4) est effectué sur des nervures vertes tel qu'il est défini aux présentes.

3. Procédé selon la revendication 1 ou 2, dans lequel les conditions de roulage pour chaque classe sont telles que les nervures roulées résultantes de toutes les classes ont une épaisseur sensiblement uniforme.

4. Procédé selon l'une quelconque des revendications précédentes, dans lequel le classement est fait selon la position de la tige de la feuille de laquelle les nervures proviennent (1) sur la plante de tabac.

5. Procédé selon la revendication 1, 2 ou 3, dans lequel le classement est fait selon le diamètre des nervures (3).

6. Procédé selon l'une quelconque des revendications précédentes, dans lequel le classement est fait premièrement selon la position de la tige de la feuille de laquelle les nervures proviennent (1) sur la plante de tabac, et puis par un premier classement des nervures de chaque classe résultante, préalablement au roulage selon le diamètre des nervures (3), afin de produire la pluralité de classes pour le roulage.

7. Procédé selon la revendication 4 ou 6, dans lequel le classement fait selon la position de la tige de la feuille de laquelle les nervures proviennent (1) sur la plante de tabac, est effectué sur des feuilles de tabac séchées préalablement au battage (2).

8. Procédé selon la revendication 7, dans lequel les nervures vertes de tabac ont une teneur en volatils au four d'entre 15 et 30%.

9. Procédé selon l'une quelconque des revendications précédentes, dans lequel un classement des nervures est effectué sur les nervures vertes roulées (5).

10. Procédé selon la revendication 9, dans lequel ledit classement des nervures, des nervures vertes roulées (5), est fait par séparation à l'air.

11. Procédé selon la revendication 9 ou 10, dans lequel ledit classement des nervures, des nervures vertes roulées (5), fournit au moins deux classes de nervures vertes roulées (A) (B).

12. Procédé selon la revendication 9, 10 ou 11, dans lequel l'une des classes (A) produites par ledit classement des nervures, des nervures vertes roulées (5), convient à la conversion directe en matière de remplissage coupée (10, 11, 12).

13. Procédé selon la revendication 9, 10, 11 ou 12, dans lequel l'une des classes (B) produites par ledit classement des nervures, des nervures vertes roulées (5), convient à l'utilisation dans la production de tabac en feuille.

14. Procédé selon l'une quelconque des revendications précédentes, dans lequel les nervures roulées sont desséchées (6).

15. Procédé selon la revendication 14, dans lequel les nervures roulées sont desséchées (6) à une teneur en volatils au four d'entre 10 et 20%.

16. Procédé selon la revendication 14 ou 15, dans lequel un classement des nervures est effectué sur les nervures roulées desséchées (7).

17. Procédé selon la revendication 16, dans lequel ledit classement des nervures, des nervures roulées desséchées

(7), est fait par séparation à l'air.

18. Procédé selon la revendication 16 ou 17, dans lequel ledit classement des nervures, des nervures roulées des-
séchées (7), fournit au moins deux classes (A') (B') de nervures roulées desséchées.

19. Procédé selon l'une quelconque des revendications 14 à 18, dans lequel les nervures roulées desséchées sont
emballées (8).

20. Procédé selon l'une quelconque des revendications précédentes, dans lequel le roulage (4) est effectué dans
l'installation d'écôtage.

21. Procédé selon la revendication 20, dans lequel le classement des nervures, des nervures vertes roulées (5), est
effectué dans l'installation d'écôtage.

22. Procédé selon la revendication 21, dans lequel le classement des nervures, des nervures roulées desséchées
(7), est effectué dans l'installation d'écôtage.

23. Procédé selon l'une quelconque des revendications précédentes, dans lequel les nervures roulées sont soumises
à un traitement supplémentaire (10, 11, 12) afin de former une matière de remplissage coupée pour incorporation
dans des articles à fumer.

24. Procédé selon la revendication 23, dans lequel le traitement supplémentaire (11) comprend au moins l'un d'entre
conditionnement, chauffe, coupe et dessiccation.

25. Procédé de fabrication d'un article à fumer comprenant fabriquer une matière de remplissage coupée selon la
revendication 23 ou 24, où ladite matière de remplissage coupée est incorporée dans un article à fumer tel qu'une
cigarette (13).

26. Procédé de préparation de nervures de tabac à utiliser comme matière de remplissage pour un article à fumer
comportant classer des nervures de tabac roulées en deux classes au moins.







